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INTRODUCING MARY M. HILL, ED. D.

Mary M. Hill, author of this issue of NCN, has been studying nutrition education, particularly in reference to school children, for several years. She believes, as do many others, that ongoing, nutrition education programs in both elementary and secondary schools have a good potential for promoting improved eating habits among school children. Advocates of blending nutrition education into existing courses rather than increasing the present tightness of the elementary school curriculum have an ally in Mrs. Hill. She knows from her teaching experience that this can be done.

Her contributions to the field of nutrition education include a monograph, in collaboration with W. J. Jacobson and F. L. Boyd, entitled "Promising Practices in Nutrition Education in Elementary Schools, 1959," and an article with W. J. Jacobson, "Lunchroom as Nutrition Lab," which appeared in THE SCHOOL EXECUTIVE, April 1959.

She joined the staff of the Household Economics Research Division, Institute of Home Economics, Agricultural Research Service, in April 1959.

NUTRITION ACTIVITIES IN ELEMENTARY SCHOOLS

Mary M. Hill, Ed. D., Nutritionist, Institute of Home Economics

Nutrition "cuts across" many areas of learning; thus, it lends itself to integration into the total school program without requiring large, special allocations of time in the schedule. However, careful planning and organization are necessary if nutrition is to be effectively taught and not lost under the heading of "incidental teaching." In many cases this means that teachers will need inservice training and competent consultant help until they learn how to include nutrition experiences in the various courses of the curriculum.

Many areas of learning vitalized.—Activities emphasizing nutrition can be initiated in schools. Besides promoting improved nutrition in children, they add enrichment to other areas of learning. Organizing observations into well written records of experiences call for the application of principles of English composition. Sharing these experiences with other classes, by means of oral reports, is a practical problem in public speaking.

The success of some projects depends on the application of the science or mathematics that the children are currently learning.

Units in social studies, particularly those concerned

with other regions or lands, can be enhanced by a comparison of food patterns of different cultures. Teachers report that sampling traditional recipes helps the children to understand the people they are studying as well as the resources of the country.

Drawing lessons take on extra meaning when basic principles of art are applied to the preparation of illustrated charts, posters, and bulletin board displays, which emphasize important nutritional concepts.

Activities to fit the situation.—Some activities help the teacher and children determine the strengths and weaknesses of their food practices while others convince them that improvement in dietary habits is reflected in general health and well-being. Still others promote improvement in health through learning to eat a wise selection of foods. Since the cooperation of the home and community facilitates improvement, activities can be undertaken to help promote understanding of the school's responsibility in dealing with the nutritional problems of children.

In this issue of NCN we report some of the ways in which nutrition activities have been woven into the

teaching in selected elementary schools. Although much more evaluation needs to be done, there has been enough to show that the types of activities described here can and do tend to promote improved eating habits in children.

DETERMINING WHAT TO TEACH

What Children Eat

Information that reveals present food practices and nutritional health of the children is helpful in planning activities based on nutritional needs. It helps to answer these questions: Is breakfast a neglected meal? Are children eating enough dark-green and deep-yellow vegetables? Citrus fruits? Are they drinking enough milk? If not, is the reason an economic one? Is it cultural? Is it a matter of habit or food preferences?

Sensitive, observant teachers have gathered such information in several ways. The behavior of a child in the classroom, lunchroom, and on the playground may provide important clues to his nutritional needs. The content of the child's conversation, storytelling, drawing, or painting may also give leads. Contacts with parents, whether in casual conversation or formal teacher-parent conferences, are another source of information. Community personnel, such as welfare department caseworkers, health department nurses and nutritionists, and the local medical and dental societies, also have important information which the school can use.

The results of well-conducted dietary surveys, properly interpreted, provide specific information concerning the kinds and amounts of food in the customary diet of the school population as a whole as well as in that of the individual child. They may also reveal information concerning regularity of meals, skipped meals, and the choice of foods eaten between meals. In some instances surveys have been conducted by teachers. The results were most helpful in educational planning when interpreted by someone competent in the field of nutrition such as home economics teachers with a background in nutrition, public health nutritionists, or the nutrition staff from nearby colleges or universities. In other instances surveys have been conducted by community agencies with the cooperation of school personnel. In still others, teachers have conducted simple surveys and compared the results with those from more intensive studies done on a regional scale by expert research teams. From such activities, teachers learn what the children will and do eat.

What Children do not Eat

To get a complete picture, it is also helpful to know what foods children will not eat in desirable amounts

and why they will not eat them. Studies of the food wasted in school lunches, especially in schools where children do not go home for lunch, have thrown light on this area of investigation. Such studies have also convinced children that they leave a great deal more food than they realize and in many cases without sufficient reason.

For example, a State supervisor of nutrition education in Louisiana encouraged children and teachers at all grade levels to conduct studies of food loss in cooperation with school lunch personnel. The activities were adapted to the interests and abilities of the children and used in several areas of learning. A class of primary children, for instance, measured the amount of milk they left in bottles or containers. They poured the milk into a number 10 can provided by the school lunch manager. Later they measured the milk by cupfuls and decided what they might do to increase their milk drinking.

Students in seventh and eighth grade classes, on the other hand, conducted more complicated food waste studies. In some schools they measured the milk left by several classes, in others they measured the green and yellow vegetables left on plates. The findings were expressed on graphs, prepared by the students, showing the percentage of waste by grade. These studies were possible because of good cooperation between teachers and school lunch personnel. The results of the studies provided guidelines for planning as well as the basis for clearly defined, obtainable goals for both teachers and children.

Such studies often convinced a teacher and his class that they were not eating enough vegetables and caused them to try to eat at least a little more each time vegetables were served in the school lunch.

Activities, such as plant growing projects followed by classroom tasting parties, were initiated. Some of the students learned to enjoy many of the foods they had previously refused to taste.

Improvement was usually noted when after a prearranged period of time, perhaps 2 or 3 months, a second food waste study was made and results were compared.

CONVINCING LEARNER THAT FOOD MAKES A DIFFERENCE

Animal Demonstrations

Such demonstrations, if carefully planned and supervised, have proved to be an excellent tool for teaching nutrition in schools. Demonstrations, comparing human diets, have been most effective when there was available a resource person experienced in the care and feeding

of laboratory animals. A knowledge of animals and their reaction to food is needed as well as a knowledge of human nutrition.

Children in the primary grades are not ready to compare the effects of different diets on animals but are intensely interested in watching small animals develop. They enjoy learning to care for and to properly handle small animals and can profit from such experience. At the same time, these activities and observations provide a foundation for dietary studies which children in higher grades are ready to attempt.

One kindergarten teacher in Newton, Mass., conducted an interesting and effective activity using small animals. It had implications for nutrition education, science, and language arts without emphasizing any one area out of proper context. For short periods of time throughout the year, because the attention span of young children is short, she brought different small animals into the kindergarten so that the children could observe and care for them. They learned how each one lived, what food it needed to survive, and how to handle it properly. The teacher and children composed a series of stories on their observations, which the teacher recorded and the children illustrated with pictures.

By the close of the school year, the children had seen for themselves that different animals require particular foods for health and growth. As a result, they were ready to accept the fact that this is also true of boys and girls, one of the basic concepts of both nutrition and science.

In higher grades, children are ready to learn that the kind and amount of food eaten makes a difference in the health and growth of animals and children. For example, sixth grade children in Oak Hill High School, Elmer, La., conducted an animal demonstration with white mice. The children prepared two wire cages to house the animals and planned the diets for them. One group was fed a well-selected diet—a type A school lunch. The other group was fed a diet consisting mostly of the foods the children said they enjoyed but without any effort to have it nutritionally adequate.

When the mice arrived, the children carefully weighed them and noted their appearance. Records, charts, and graphs on the weights, appearance, and disposition of the two groups were kept by the children. Before long they noticed changes taking place in the mice. The group on the nutritionally unbalanced diet began to lose weight and their hair became dull. The children noticed, too, that these animals were not playful or friendly, but seemed to want to bite when they were handled. In sharp contrast, the other group of mice thrived on the school lunch. They gained weight, their

hair had a glossy sheen, and their eyes were bright and alert. These mice played around their cages and were friendly when handled.

When sharp differences in gowth were apparent, all the animals were fed the well-selected diet. Recovery was quite dramatic and the children saw for themselves that improved eating habits are reflected in both growth and general health but, that "it is never too late to mend one's ways."

The teacher reported that this activity made a lasting impression on most children and in many cases was instrumental in encouraging children to eat and enjoy a wider variety of the foods served to them in the school lunch.

Plant-growing Projects

Well-planned "growing projects" have also been a means of convincing children that food makes a difference in growth and development. Young children are ready to observe growing plants and to appreciate that they must have water, sunlight, and nourishment from the soil in order to grow properly. If food plants that are good sources of important nutrients are used, the children have an opportunity to relate this basic concept to themselves.

A science consultant in Ossining, N. Y., planned numerous such experiments for third grade classes and gave consultant help to teachers who requested it. Additional help was available from a local greenhouse, which supplied several dozen clay pots for classroom use. The garden club, garden section of the newspaper, and trade books were found to be good resources for this type of science unit.

The children gathered pebbles and placed them in a clay pot for drainage. They then filled the pot with soil. The seeds were planted and tended and the children learned many things about plants, such as the fact that seeds will not germinate if planted too deep or if they are not properly watered. They also learned, by planting different kinds of seeds, that different kinds of plants need different kinds of soil in order to grow and develop properly.

When the seeds had germinated and were beginning to show healthy growth, the children took them home and transplanted them into prepared garden plots. The class took short walks to the homes of the children during the following days to examine the transplants and to observe their growth until they were ready for harvest. Only quick-growing kinds are suitable if vegetables are to be harvested before the close of schools.

A classroom tasting party of the vegetables raised makes a fine culminating activity for this science project. Children seldom refuse to taste a vegetable that they have helped to raise. Repeated experiences of this nature help to establish good eating habits as well as to decrease food rejection in the school lunch.

PROMOTING USE OF A WIDE VARIETY OF FOODS

Making School Lunch an Integral Part of the Total School Program

Does the school lunch have a contribution to make to the overall school program? One elementary principal said that "the school lunch program was planned to improve the nutrition of children. It is, therefore, one of the most natural sources of help in the teaching and practicing of nutrition."

The teacher-manager of school lunch, Mineola, Long Island, N. Y., was hired to function as a resource person for classroom projects as well as to direct the school lunch. A class, learning about children in other times or other regions of the world, can profit from preparing and sampling dishes peculiar to the time or the area. At such times, the teacher-manager goes into the classroom and plans with the children for laboratory work of this nature.

The activity is generally culminated by the children planning a typical menu that meets Type A standards. This is served in the school lunch and credit is given the class on the monthly menus distributed to all the children in the school. Preparing the rest of the school to accept the menu is a challenge to the ingenuity of the children and a means of using principles learned in several areas of the curriculum.

Does the teacher have a contribution to make to the successful school lunch? The principal of a Louisiana elementary school had this to say: "The lunch hour is just as important from an educational standpoint as any other hour of the schoolday—physically, socially, culturally, spiritually. Therefore, the teacher is one of the important keys to the situation."

The children in Woodland Elementary School, Pineville, La., are prepared for the lunch experience in the classroom. In science, they learn values of different foods and in health, cleanliness is emphasized by such activities as the washing of hands before meals. The social graces are taught by demonstrations and skits which show how to handle silver, how to sit, and how to eat. The teacher continues her teaching as she sits with her group and sets a good example for them by eating a variety of foods and by willingly trying new foods.

In Louisiana, many of the children throughout the State belong to the "two-bite" club. Each member promises to try at least two bites of any food served to him, particularly those served in the school lunch. This practice is encouraged because of its potential for helping children to establish and make permanent good eating habits and wholesome attitudes toward food without encouraging children to force themselves to eat large quantities of a new or distasteful food. Thus the school lunch becomes a laboratory where classroom learnings may be tested and used and where good eating habits and wholesome attitudes toward food may be established or reinforced.

Enlisting Parental Cooperation

The school lunch supervisory staff of the Belmont, Calif., Elementary School District, concerned about school lunch participation, took the problem to the superintendent of schools (1). He formed a "Food Service Committee" consisting of the superintendent, the busiiness manager, school principals, school nurses, the school lunch supervisor, and the school lunch managers. They explored each possibility for solution of the problem in terms of its contribution to the educational program. It was recognized that increased parental understanding and cooperation would improve participation in the school lunch program and result in a better educational program as well. Since "seeing is believing," they decided to try inviting parents to eat lunch in school with their children. Each Tuesday became Parents' Day with a different class each week inviting parents, and by the end of the school year every class had participated once.

Teachers had the privilege of choosing when their class would entertain and how the event would be woven into their overall teaching program. The school lunch supervisor and managers cooperated in many ways. For example, they worked with teachers and committees of children to develop special menus for the occasion. These menus, like the regular daily menus, met Type A standards. In some instances the menu was typical of the country the children were studying in social studies classes.

Displays on bulletin boards explained the Type A lunch and its contribution to the daily food requirements of school children. Invitations were composed and written, and attractive place mats were made. Knowledge and understanding tend to be increased when there are a variety of opportunities to "learn by meaningful doing." Since this applies to learning desirable food habits as well as to any other area, every subject in the

curriculum was related to school lunch by one class or another. At the same time, the school lunch staff had a chance to increase its understanding of the clientele it serves.

Parents had an opportunity to see the school in action and to appreciate particularly the care with which their children's lunches were planned and prepared despite the problems that school feeding presents.

After several months the trial program was evaluated. Parents liked the idea and accepted the invitations. Daily school lunch participation, so helpful in the establishment of good eating habits, had increased. Although it was not an original objective, the public relations of the school had also improved.

Communities made up of several different ethnic backgrounds, however, present special problems to school personnel. In many instances parents are not familiar with the foods or possibly the methods of preparation of foods served in the school lunch because these foods are foreign to their own cultural food patterns. This does not indicate disinterest or unwillingness to cooperate; it does indicate a need for improved communication.

Well-planned meetings with parents have been conducted at which foods that are rich sources of nutrients were shown, methods of preparation used in the school lunch were demonstrated, and cost comparisons were made. They were a real service to foreign-born parents and were most helpful in enlisting parental cooperation. For example, the health counselor in Public School 105, an elementary school in New York City, became concerned over the health records of many boys and girls. It seemed possible that the students were not eating enough fruits and vegetables, particularly dark-green and deep-yellow vegetables. Many students were newly arrived from Puerto Rico and when questioned, it was found that they were eating little other than the traditional beans and rice. Further questioning revealed that their parents did not find in the markets familiar fruits and vegetables which they could afford to buy and did not know which of the available ones to substitute.

She took her problem to the Spanish consultant who is employed by the Board of Education to help these people over a language difficulty. The consultant communicated with the nutrition staff at Teachers College, Columbia University, where a nutrition education program was underway. Two advanced students of nutrition, who were directing their attention to nutrition education in schools, prepared an appropriate demonstration for the parents.

Dark-green and deep-yellow vegetables were discussed,

with the help of the interpreter, in terms of food value, cost, and appropriate methods of preparation. Care was taken to include some foods that were familiar to them as well as to introduce new ones. For example, sweetpotatoes were chosen because they are familiar and similar in appearance to yautia, another root vegetable familiar to the parents. Sweetpotatoes, however, are a much better source of vitamin A. Both parents and students enjoyed tasting the vegetables that had been prepared and were pleased to receive recipes written in both Spanish and English. This was one of many such meetings in New York City. Both parents and school personnel have repeatedly requested demonstrations on the use of other foods rich in nutrients likely to be low in diets.

Promoting Use of Wholesome Snacks

The principal of a Philadelphia elementary school became concerned over the types of snacks children were bringing to school and the school's responsibility to do something about it(2). He noticed that candy, cookies, and pretzels were predominant among the foods brought and that fruit seemed to be an infrequent choice. He believed that fruit would be more in line with the eating habits which the school was trying to promote. After conferring with the school nurse, teachers, parents, and custodian, he initiated a fruit program.

Plans were made with a local fruit merchant to deliver an order to the school each morning. Fruit was purchased that was in good condition but could be sold for 2 or 3 cents. This included oranges, apples, plums, tangerines, and bananas, purchased by the bushel. Parents from the home and school association came in almost daily to serve the children and to see that they placed the refuse in the extra trash cans which the custodian provided. The fruit was sold as near to cost as possible but funds did accumulate because of the volume sold. These funds were used on days when special occasions such as Thanksgiving and Christmas were celebrated by giving each child a piece of fruit that day.

The principal, faculty, and parents noticed some interesting results of the program. The children came to school expecting to find some kind of fruit they could buy and thus did not spend their money en route. The school staff were pleased to notice that gum chewing practically disappeared from the school. Candy and cake snacks were materially reduced and children who did not purchase fruit started to bring fruit from home. The custodian was pleased to notice a reduction in the number of sticky candy wrappers he had to pick up.

Neighboring schools took note of the program and initiated similar programs for their children.

Thus, it becomes apparent that one way to promote the use of wholesome snacks is to make them available for the children at a price they can pay.

ORGANIZING ACTIVITIES INTO EFFECTIVE PROGRAMS

Team Approach—School, Home, Community

School.—Effective teaching in nutrition can only be done by teachers who are convinced that the kind and amount of food eaten makes a difference in the health and performance of the child-now and as an adult. A teacher, who believes this to the extent that he will recognize and attempt to resolve his own nutritional problems and thereby set a good example for his class, has a real capacity for successful teaching.

School programs depend on the cooperation and support of the administrator. For example, sometimes it is necessary to adjust schedules to permit one class to share learnings with other classes. Occasionally a wellplanned field trip or other activity, which would enrich classroom work, takes funds. Administrators, convinced of the program's value to the children, generally can find a way to meet the situation.

Programs are improved by the school lunch functioning as a nutrition laboratory for classroom learnings. This requires understanding of objectives and operational problems on the part of both teaching and school lunch staff.

The effectiveness of programs can be increased by making good use of all available resources in the school. Teachers of homemaking, science, and health as well as doctors, dentists, and nurses can often function in this capacity if their workload is adjusted to permit it.

Home.—Any program dealing with habits that are practiced at home must have the understanding and cooperation of parents if confusion is to be avoided. It is not enough to encourage children to eat a variety of foods in school. Desirable habits are the result of repeated experience with good food practices at home and in school. Tasting parties in the classroom and school lunch participation present opportunities for children to taste and learn to enjoy unfamiliar foods. Parents can help by using the same foods at home and assuming a positive attitude toward the school program. Good rapport between school and home is therefore of utmost importance.

Community.—By the same token, any school program dealing with public health must have the understanding and cooperation of related community agencies. Nutrition alone cannot ensure good health. Existing physical defects must be corrected if possible. Public health and other agencies provide for the treatment of such defects should the family be unable to do so. In many cases, related community agencies have provided funds, helped in gathering information, and promoted the concepts of the school program by organizing their community programs along similar lines.

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Managers of local food markets are in a position to reinforce school programs in several ways. Some have permitted children to display nutrition exhibits in their store windows. Others have opened their markets for children's field trips. Such trips, however, require careful planning and organization to be of real value to a school program.

Good communication is vital to a team approach. Thus it would seem wise to have each group represented on curriculum planning committees to consider their respective responsibilities and possible contributions.

EVALUATION

Demonstration programs in nutrition education have been conducted in a limited number of schools and evaluated in terms of improved dietary practices, nutritional status, and growth rate of children.

Food records—Ascension Parish, La. (3)—The eating habits of school children were appraised on the basis of 7-day food records. The school initiated activities in nutrition education which focused on the dietary weaknesses the appraisal revealed. One year later, a second appraisal indicated improvement in eating habits. Emphasis on nutrition was continued and subsequent appraisals made at the end of 2, 3, and 4 years, revealed further improvement.

Food records and nutritional status—Cape Sable Island, Nova Scotia (4).—The nutritional status of a random sample of one-fifth of the island's families was studied by the Nova Scotia Department of Health. Doctors, dentists, and laboratory technicians made physical and biochemical examinations. The children kept 7-day food records with the help of parents and the nutritionist.

An educational program followed, centered in the schools but extended to include the understanding and cooperation of the entire community, which was designed to promote improvement where the preliminary study indicated a need. Periodic surveys of food habits

After 5 years another survey of food records and nutritional status was made (5). Both kinds of studies indicated that dietary inadequacy had been decreased. During this period, enriched bread was introduced on Cape Sable Island and became an important factor in the diet of the people. Those who were involved in the study were convinced, however, that the work in the schools was the chief factor contributing to the improvements in nutrition shown by the survey.

Food records and growth records—New York City Public School 105 (6).—Sostman studied the methods, techniques, and findings used during a 6-year nutrition education program in a city school. She found evidence of improvement in the eating habits of the children. School lunch participation had increased from 25 to 42 percent and school personnel noticed a decrease in food waste in the lunchroom as the program progressed.

The percentage of children coming to school without breakfast dropped from 10 to 4 percent. The quality of breakfasts eaten also showed improvement. In classes where nutrition was emphasized, 36 percent of the children ate breakfasts that met one-fourth of the daily allowances recommended by the National Research Council. On the other hand, the breakfasts of only 11 percent of the children met these standards in classes where no such emphasis was given.

The average yearly gains in height and weight of the children who participated in the program during the last 3 years were studied. Those who participated had made significantly greater gains in weight but there was no statistically significant difference in the increase in height.

IN ESSENCE

In each one of these demonstration programs, activities such as those described above were employed because they are consistent with our best knowledge of nutrition as well as our best knowledge of how children learn and develop. In every case, however, activities were organized into ongoing, sequential programs. Some form of inservice training for teachers was also provided such as study groups, workshops and courses in nutrition for which college credit was given.

Demonstration programs in a variety of community situations, carried on over a long enough period of time to make evaluation possible, would provide information upon which improved programs could be designed.

Even with a team approach, progress apears to be slow and good eating habits seem to evolve only as a result of continued experience with desirable food practices. Progress can be measured, however, by periodic surveys of food practices, repeated observation of children's acceptance of foods served in the school lunch, and by studies of their general health and growth records.

When regarded in terms of its importance to the children who will be the adults of the future, improvement, however slight is well worth the time and effort required to effect it.

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TION EDUCATION AND SCHOOL LUNCH (ICNESL)

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WILL YOU CONTRIBUTE?

Some of our readers have requested information concerning techniques of increasing acceptance of foods in the school lunch. We are planning an issue of NCN on merchandising the school lunch. If you have developed any "tricks-of-thetrade" which you are willing to share with others, please send your stories in now for possible inclusion in the proposed issue. Please remember, our readers want details.

Mary M. Hill.

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